Press Release

DOE Announces $36 Million for High-Temperature Materials Projects

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WASHINGTON, D.C. - The U.S. Department of Energy has announced $36 million in awards for 18 projects as part of the High Intensity Thermal Exchange through Materials and Manufacturing Processes (HITEMMP) program, as well as the final OPEN+ Cohort, High Temperature Devices. These project teams seek to develop new approaches and technologies for the design and manufacture of high temperature, high pressure, and highly compact heat exchangers and components.

Durable and affordable higher-temperature heat exchangers could make energy conversion much more efficient, which in turn could reduce fuel consumption, system footprint, capital and operational cost, and emissions.

Heat exchangers are critical to efficient thermal energy use in a variety of applications, including electricity generation, nuclear reactors, transportation, petrochemical plants, waste heat recovery, and many more. HITEMMP projects will target heat exchangers capable of operating for tens of thousands of hours in temperatures and pressures exceeding 800°C and 80 bar (1,160 psi) respectively.

A sampling of HITEMMP projects can be found below, and for the full list of projects click here. For the full list of the OPEN+ high temperature cohort projects, click here.

The Ohio State University – Columbus, OH

Additively Manufactured High Efficiency and Low-Cost sCO2 Heat Exchangers– $1,500,000

The Ohio State University will design, manufacture, and test high-performance, compact heat exchangers for supercritical CO2 power cycles. Two innovative additive manufacturing processes will enable high performance. One facilitates up to 100 times higher deposition rate than regular laser powder additive manufacturing. The other enables crack-free additive manufacturing of an advanced nickel-based superalloy and has the potential to print features as fine as 20 micrometers. These innovations will halve the fabrication cost and enable heat exchanger operations above 800°C (1472°F) and 80 bar (1160 psi). These systems have applicability in high-efficiency fossil energy, concentrating solar power, and small modular nuclear energy.

International Mezzo Technologies – Baton Rouge, LA

Supercritical CO2 Micro Tube Recuperator: Manufacturing, Testing and Laser Weld Qualification – $1,640,000

International Mezzo Technologies will design, manufacture, and test a compact, nickel-based superalloy supercritical carbon dioxide (sCO2) recuperator. The recuperator will incorporate laser-welded micro tubes and function at 800°C (1,472°F) and 275 bar (3,989 psi). Currently, the cost of recuperators of power systems operating in these conditions is prohibitive. Laser welding micro tubes offers a low-cost approach to fabricating heat exchangers, which will increase the economic competitiveness of sCO2 power cycles.